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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,348	11/14/2003	Seiji Katsuoka	2003_1648A	1190

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EXAMINER

EDWARDS, LAURA ESTELLE

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/712,348

Applicant(s)

KATSUOKA ET AL.

Examiner

Laura Edwards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7,9,10,18,19,23,28,29,33 and 72-75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7,9,10,18 and 33 is/are allowed.
- 6) ☒ Claim(s) 19,23,28,29 and 72-75 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 19, 28, 73, and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al (US 6,294,059) in view of Volodarsky et al (US 6,352,623).

Hongo et al teach a substrate processing apparatus comprising a loading/unloading area (20) for loading and unloading a substrate; a combined plating and cleaning area (30), the plating area including at least one pretreatment unit (31) including a bath for applying sulfuric acid (i.e., cleaning) to the substrate before plating and a first plating bath (32); the plating area includes a second plating unit (32) opposed to the first plating unit as well as a second treatment unit (31) (see Figs. 7 and 8). Hongo et al are silent concerning the plating unit including spray nozzles for spraying treatment liquid onto the substrate. However, it was known in the art at the time the invention was made, to provide at least one or more spray nozzles in a combined plating and cleaning area in order to allow liquid treatment of the processing surface of a substrate effectively, efficiently, and contaminant free in a single unit as evidenced by Volodarsky et al (col. 2, lines 25-33, lines 56-63 and col. 6, lines 18-26, lines 43-50, and lines 60-67). It would have been obvious to one of ordinary skill in the art to incorporate at least one or more spray nozzles as taught by Volodarsky et al within the plating area (30) of the Hongo et al apparatus in order to provide for an alternative means for applying liquid treatment to the substrate effectively, efficiently, and in a contaminant free single unit.

With respect to claim 28, the apparatus as defined by the combination above would provide for at least one spray nozzle capable of applying cleaning liquid onto the substrate of the

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substrate following plating because Volodarsky et al recognize in col. 6, lines 27-32 that the cleaning of the substrate [with nozzles] in the cleaning area can result prior to and following ECMD processing of the wafer.

With respect to the pretreatment unit applying a catalyst, Volodarsky et al recognize that the nozzles can be used to apply anything from water, acidic or basic solutions, or organic solvents (see col. 6, lines 19-22 and lines 64-67) such that the use of the pretreatment unit to apply a catalyst would be within the purview of one skilled in the art.

Claims 23 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al (US 6,294,059) in view of Nystrom (US 3,916,937) or Pellegrino (US 4,174,261) and further in view of Bergman et al (US 5,377,708).

Hongo et al teach a substrate processing apparatus comprising a loading/unloading area (114a, 114b) for carrying in and out a substrate; cleaning area (160) for cleaning the substrate; and a plating area (119) provided with a plating unit for plating the substrate, wherein the plating area is provided with a plating solution supply device (see Fig. 12, no detailed disclosure or numbering) with plating solution being somehow supplied to a processing tank. Hongo et al are silent concerning the processing tank including a circumferential overflow groove to receive plating solution overflowing from the tank and a vertical centrifuge supply pump to recirculate plating solution from the overflow groove back to the processing tank. However, it was known in the substrate processing art, at the time the invention was made to provide a circumferential or perimeter groove about a processing tank in communication with a pump system for enabling processing liquid overflow to be removed from the processing tank and be recirculated back to

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the processing tank as evidenced by Bergman et al (see col. 10, lines 11-24). It would have been obvious to one of ordinary skill in the art to provide an overflow processing tank groove in communication with a pumping system as taught by Bergman et al in the Hongo et al plating unit in order to enable excess processing liquid to be recovered and recirculated back to the processing tank. Although Bergman et al are silent concerning the pump system including a vertical centrifugal type pump, it was known in the art, at the time the invention was made, to utilize a vertical centrifugal pump in association with a plating unit to supply the plating liquid to the unit as evidenced by Nystrom (see pump 12) or Pelligrino (see pump 34). In light of the conventional use of a centrifugal type pump with a plating system as evidenced by Nystrom or Pelligrino, it would have been obvious to one of ordinary skill in the art to provide a vertical centrifugal pump type system in the apparatus defined by the combination above as a means to supply and/or recirculate processing liquid back to the processing tank.

With respect to claim 75, the Bergman pumping system which recovers overflow liquid and recirculates the liquid back to the processing tank includes an inline heater (63) so as to temper the processing liquid at a desired temperature as evidenced by Bergman (see col. 8, lines 59-66) such that it would have been obvious to one of ordinary skill in the art to provide an inline heater in the apparatus as defined by the combination above to temper the processing liquid as desired so as to provide for hot plating of the substrate.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al (US 6,294,059) in view of Jacobs et al (US 3,489,608).

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Hongo et al teach a substrate processing apparatus comprising a loading/unloading area (20) for loading and unloading a substrate; a combined plating and cleaning area (30), the plating area including at least one pretreatment unit (31) including a bath for applying sulfuric acid (i.e., cleaning) to the substrate before plating and a first plating bath (32); the plating area includes a second plating unit (32) including a second plating bath opposed to the first plating unit as well as a second pretreatment unit (31) (see Figs. 7 and 8). Hongo et al are silent concerning the use of a spray nozzle capable of cleaning at least one pretreatment housing or vessel about a circumferential direction. However, it was known in the art, at the time the invention was made to provide within a treating vessel for a substrate, at least one nozzle to provide a desired spray pattern of a fan spray or round full conical spray pattern to apply chemical or cleaning liquids so as to enable treating or cleaning of the substrate as well as treating or cleaning the interior of the treatment unit or housing as evidenced by Jacobs et al (see col. 5, lines 42-64). In light of the teachings of Jacobs et al, it would have been obvious to one of ordinary skill in the art to provide a spray nozzle of a desired spray pattern (i.e., circumferential spray pattern) within at least one of the pretreatment unit housings so as to enable simultaneous treatment of the substrate and cleaning of the vessel within a single area so as to minimize substrate processing time.

Allowable Subject Matter

Claims 7, 9, 10, 18, and 33 would be allowable.

Response to Arguments

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Applicant's arguments with respect to the claims with the exception of claim 29 have been considered but are moot in view of the new ground(s) of rejection.

Applicants contend that with respect to claim 29, Jacobs does not suggest circumferential spray of the vessel or unit to clean but rather use of a downward spray. However, this argument is not deemed persuasive because Jacobs recognizes use of at least one nozzle of a desired spray pattern including full conical spray (see col. 5, lines 42-64) which would imply that one skilled in the art would recognize the use of an appropriate spray nozzle of desired spray pattern. The use of a spray nozzle with a circumferential spray pattern would be within the purview of one skilled in the art especially when the processing tank or vessel is of cylindrical shape.

Conclusion

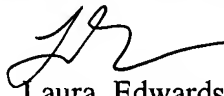
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura Edwards whose telephone number is (571) 272-1227. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Laura Edwards
Primary Examiner
Art Unit 1734

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August 29, 2005